

EXPANDABLE POLYMERIC FIBERS AND THEIR METHOD OF PRODUCTION

ABSTRACT OF THE DISCLOSURE

5 The present invention is directed to thermo-expandable fibers and to the expanded
hollow fibers or microtubes, microcellular foam or foamed composite material that results
upon heating the expandable fibers. The thermo-expandable fiber of the present invention
is characterized by having a polymeric wall surrounding one or more pockets or particles of
blowing agent or propellant within the fiber. The polymeric wall may have reactive
10 functional groups on its surface to give a fusible fiber. When the expandable fibers are
heated, they expand to form hollow fibers or microtubes comprising polymeric shells
surrounding one or more internal gaseous voids, and when the fibers are expanded while
in contact with each other, a microcellular foam may be formed. The foam consists of a
plurality of hollow fibers fused together, optionally aided by functional groups present on
15 the surface of the heated fibers that act to crosslink the material. When expandable
microspheres are mixed with a matrix, which can optionally react with functional groups on
the fiber surface, and the resulting combination is heated, the fibers expand to give a
foamed composite material in which the hollow fibers or microtubes may optionally be
fused or chemically crosslinked to the matrix.